

# Notice of Allowability

Application No.

10/648,461

Examiner

Mark P. Francis

Applicant(s)

MCCRADY ET AL.

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2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 08/21/06.
2. ☒ The allowed claim(s) is/are 2-3, 21-22, and 40-41, now renumbered as claims 1-6.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
MENG-AL  
ADVISORY PATENT EXAMINER  
BIOLOGICAL CENTER 2100

### DETAILED ACTION

1. This Office Action is responsive to the communication filed August 21, 2006.

2. Per applicant's request, amended claims 2, 21, and 40 have been entered.

Claims 1, 4-20, 23-39, and 42-47 are cancelled. Claims 2,3,21,22, 40, and 41 are pending.

3. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

4. Authorization for this examiner's amendment was given in a telephone interview with Attorney Christos A. Ioannidi on November 03,2006.

Claim 21. (Currently Amended) A computer-readable storage medium having computer-executable instructions when executed by a computer for compiling computer code, the method comprising:

creating a flowgraph according to abstract computer instructions, wherein the flowgraph has a plurality of basic blocks and at least one data object, and wherein the abstract instructions are translated from a parse tree formed from computer code;  
assigning a depth-first order to the plurality of basic blocks;  
determining a dominance relationship between the plurality of basic blocks;

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determining whether any loops are present within the flowgraph and, if any loops are present, identifying the loops;

determining a usage of the at least one data object;

determining a creation point, destruction point and lock point for the at least one data object according to the usage, identified loops, dominance relationship and depth-first order of the plurality of basic blocks; and

inserting instructions into the computer code to create the at least one data object at the creation point, to destroy the at least one data object at the destruction point and to lock the at least one data object at the lock point; and:

wherein determining a creation point further comprises:

identifying a first use of the at least one data object and identifying a first basic block in which the first use occurs from the plurality of basic blocks, wherein the first use of the at least one data object is the original creation point;

identifying a use of the at least one data object subsequent to the first use and

identifying a second basic block in which the subsequent use occurs from the plurality of basic blocks;

calculating an intersection of the pre-dominators of the first basic block with the pre-dominators of the second basic block;

determining whether the intersection contains the first basic block; and

choosing, if the intersection does not contain the first basic block, a new creation point from the intersection.

inserting instructions into the computer code to create the at least one data object at

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the creation point, to destroy the at least one data object at the destruction point and to lock

the at least one data object at the lock point; and:

wherein determining a creation point further comprises:

identifying a first use of the at least one data object and identifying a first

basic block in which the first use occurs from the plurality of basic blocks, wherein the

first use of the at least one data object is the original creation point;

identifying a use of the at least one data object subsequent to the first use and

identifying a second basic block in which the subsequent use occurs from the plurality of basic blocks;

calculating an intersection of the pre-dominators of the first basic block with

the pre-dominators of the second basic block;

determining whether the intersection contains the first basic block; and

choosing, if the intersection does not contain the first basic block, a new

creation point contained in the intersection.

#### ***Allowable Subject Matter***

5. Claims 2,3,21,22, and 40-41 are allowed.

6. The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or fairly suggest at least the feature of:

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determining a creation point, destruction point and lock point for the at least one data object according to the usage, identified loops, dominance relationship and depth-first order of the plurality of basic blocks; and

inserting instructions into the computer code to create the at least one data object at the creation point, to destroy the at least one data object at the destruction point and to lock the at least one data object at the lock point, in such a manner as recited in each of the independent claims 2,21,and 40.

The prior art of record Radigan teaches A computer-readable storage medium having computer-executable instructions when executed by a computer for compiling computer code, the method comprising: creating a flowgraph according to abstract computer instructions, wherein the flowgraph has a plurality of basic blocks and at least one data object, and wherein the abstract instructions are translated from a parse tree formed from computer code;

assigning a depth-first order to the plurality of basic blocks;

determining a dominance relationship between the plurality of basic blocks;

determining whether any loops are present within the flowgraph and, if any loops are present, identifying the loops;

but does not teach determining a creation point, destruction point and lock point for the at least one data object according to the usage, identified loops, dominance relationship and depth-first order of the plurality of basic blocks; and

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inserting instructions into the computer code to create the at least one data object at the creation point, to destroy the at least one data object at the destruction point and to lock the at least one data object at the lock point, in such a manner as recited in each of the independent claims 2,21,and 40.

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

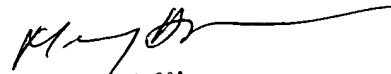
#### **Correspondence Information**

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark P. Francis whose telephone number is (571)272-7956. The examiner can normally be reached on Mon-Fri 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T.An can be reached on (571)272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
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